

**BUSITEMA UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**DEPARTMENT OF COMPUTER ENGINEERING**  
**FINAL YEAR PROJECT REPORT**  
**WATER TANK LEAKAGE DETECTION AND NOTIFICATION**  
**SYSTEM**

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**A Final Year Project Report submitted to the Department of Computer Engineering in  
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## DECLARATION

I **OCHOM BRIAN**, do hereby declare that this Project Report is original and has not been submitted for any other degree award to any other University before.

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## **DEDICATION**

I dedicate this report to my parents Mr Kawolo Paul Olowo and Mrs Asio Phyllis who have supported me financially in this whole process of completing my project and always encouraging me to think positively. I pray that the Almighty God rewards them abundantly.

I also dedicate it to my friends who have always been there for me; Muwanguzi Paul, Muganyizi Alex, Kyampeire Hadijah, Nakitto Zubedah, Ndekera Geoffrey, Soyekwo Eliut, Kibego Gilbert and Naiga Harriet. I know that the Almighty God will continue blessing them blessing upon blessing.

Finally I also dedicate it to Dr. Semwogerere Twaibu who has been my wonderful supervisor throughout this whole process. God bless you.

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Lastly, great thanks goes to the department of computer engineering for the support given to me during my stay in Busitema University.

I pray that the Almighty Lord rewards you abundantly.

## **LIST OF ACRONYMS**

ADC	Analog-to-Digital Converter
AT	Attention
ATG	Automatic Tank Gauging
GSM	Global System for Mobile communications
LCD	Liquid Crystal Display
LED	Light Emitting Diode
SCADA	Supervisory Control and Data Acquisition
SIR	Statistical Inventory Reconciliation
SMS	Short Message Service
UST	Underground Storage Tank

## **ABSTRACT**

A leak is a way (usually an opening) for fluid to escape a container or fluid-containing system, such as a tank or a ship's hull, through which the contents of the container can escape or outside matter can enter the container. Leaks are usually unintended and therefore undesired. The word leak usually refers to a gradual loss; a sudden loss is usually called a spill[1].

Leaks in water tanks especially in overhead water tanks are usually ignored or taken lightly and yet these leakages contribute to high water bills to the customer. A leak of only one liter per minute corresponds to 525,600 liters per year. A leak of only one drop per second represents a water loss of 10,000 liters per year[2]. In cases where the water tanks are located on the ground, the leakage in the tanks can be a source of water contamination since the hole can become a passage of dirt into the tanks. Leak detection means a device or method that is capable of detecting leaks in a storage tank system.

Saving water is very important to everybody since saving water means saving on water bills especially at such a time when the economic status is so pressing on everyone rich or poor and yet the demand for water is increasing every day[3].

This project was therefore aimed at developing a water tank leakage and notification system.

The work is arranged mainly in six chapters, Chapter one includes the introduction of the Project. Chapter two discusses the literature related to the system, chapter three illustrates the methodologies used in coming up with the working prototype of the system, chapter four includes system design and analysis, chapter five contains the implementation and testing of the system and chapter six contains the summary of the work, discussions and recommendations.

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# CHAPTER ONE

## 1.0 INTRODUCTION

This chapter comprises of the background, problem statement, objectives and significance of the project.

## 1.1 BACKGROUND

A water tank is a container which is used to hold water. They are used in a wide variety of settings and for an assortment of purposes all over the world. The need for a water tank is as old as civilization, to provide storage of water for use in many applications, drinking water, irrigation agriculture, fire suppression, agricultural farming, both for plants and livestock, chemical manufacturing, food preparation as well as many other uses[4].

There are various types of water storage tanks and liquid storage tanks; some of them include;[5] Corrugated Steel Tanks, Welded Steel Tanks, Fiberglass Tanks, Pillow (Bladder or Collapsible or blivet) Tanks, Onion tanks, Frame tanks, Poly Tanks. However my main focus is on leaks in Poly tanks.

A leak is a way (usually an opening) for fluid to escape a container or fluid-containing system, such as a tank or a ship's hull, through which the contents of the container can escape or outside matter can enter the container. Leaks are usually unintended and therefore undesired. The word leak usually refers to a gradual loss; a sudden loss is usually called a spill.

Leaks in water tanks especially in overhead water tanks are usually ignored or taken lightly and yet these leakages contribute to high water bills to the customer. A leak of only one liter per minute corresponds to 525,600 liters per year. A leak of only one drop per second represents a water loss of 10,000 liters per year[2]. In cases where the water tanks are located on the ground, the leakage in the tanks can be a source of water contamination since the hole can become a passage of dirt into the tanks. Leak detection means a device or method that is capable of detecting leaks in a storage tank system.

Saving water is very important to everybody since saving water means saving on water bills especially at such a time when the economic status is so pressing on everyone rich or poor and yet the demand for water is increasing every day[3].

To reduce such amounts of water losses as a result of leaks in water tanks a water tank leakage detection system is needed. It will be able to detect a leakage within the water tank and once the leakage is

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